Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

LIBRARY OF
CONGRESS
SERIAL RECORD
APR 8 1944
Copy
GOVT. SOURCE

[In binding the bulletins for 1903, pages i-viii at the end of this Bulletin should be detached and placed before Bulletin 99, which begins with page 1.]

89

Maine Agricultural Experiment Station

BULLETIN No. 99.　　　　DECEMBER, 1903.

FINANCES, METEOROLOGY, INDEX.

This Bulletin contains the newspaper bulletins published in 1903, the summary of the meteorological observations, the Report of the Treasurer, and the index for the bulletins issued in 1903. Bulletins 89 to 99 make up the Nineteenth Annual Report of the Station.

Requests for the Bulletins should be addressed to the
AGRICULTURAL EXPERIMENT STATION,
Orono, Maine.

MAINE
AGRICULTURAL EXPERIMENT STATION
ORONO, MAINE.

THE STATION COUNCIL.

PRESIDENT GEORGE E. FELLOWS	*President*
DIRECTOR CHARLES D. WOODS	*Secretary*
JOHN A. ROBERTS, Norway	*Committee of Board of Trustees*
CHARLES L. JONES, Corinna	
ALBERT J. DURGIN, Orono	
AUGUSTUS W. GILMAN, Foxcroft	*Commissioner of Agriculture*
EUGENE H. LIBBY, Auburn	*State Grange*
CHARLES S. POPE, Manchester	*State Pomological Society*
RUTILLUS ALDEN, Winthrop	*State Dairymen's Association*
JAMES M. BARTLETT	*Members of the Station Staff*
LUCIUS H. MERRILL	
FREMONT L. RUSSELL	
WELTON M. MUNSON	
GILBERT M. GOWELL	

THE STATION STAFF.

THE PRESIDENT OF THE UNIVERSITY.

CHARLES D. WOODS	*Director*
JAMES M. BARTLETT	*Chemist*
LUCIUS H. MERRILL	*Chemist*
FREMONT L. RUSSELL	*Veterinarian*
WELTON M. MUNSON	*Horticulturist*
GILBERT M. GOWELL	*Stock Breeding and Poultry*
——— ———	*Entomologist*
MARSHALL P. CUMMINGS	*Assistant in Horticulture*
HERMAN H. HANSON	*Assistant Chemist*
SANFORD C. DINSMORE	*Assistant Chemist*

NEWSPAPER BULLETINS PUBLISHED IN 1903.

CHAS. D. WOODS.

Whenever there is matter of importance which we wish to bring promptly to the attention of the people of the State, we make as clear and concise a statement as possible in the style and type of a newspaper column and mail it as a "Special Newspaper Bulletin" to all the press on the Station exchange mailing list. These newspaper bulletins are quite generally printed by the papers, and the Station is under obligations to the press for this opportunity of specially and promptly being put in touch with the people.

During the year the Station has issued several special newspaper bulletins on miscellaneous subjects. The subject matter of four of the newspaper bulletins has not appeared in any of the regular bulletins of the Station and is therefore here reprinted as a matter of permanent record.

FERTILIZER FOR MANGOLDS.

RESULTS OF 27 YEARS EXPERIENCE ON SAME LAND.

Mangolds (Mangel wurzels) are a valuable crop for poultry and sheepmen, and where corn silage is not grown they are very desirable for the dairy farmer. Six to seven hundred bushels, weighing 15 to 18 tons, is the usual yield on good soil with clean cultivation. This yield gives about 1½ to 1¾ tons of dry matter per acre, or as much as supplied by 12 to 14 tons of corn silage. At the Rothamsted (England) Experimental Station mangolds have been grown continuously on the same land for 27 years. The field was divided into eight plots, and careful study has been made of the feeding capacity of this crop. The results are published in the Journal of the Royal Agricultural Society, a publication not available to Maine farmers. The following summary of the results of these experiments on the continuous growth of mangolds for 27 years at Rothamsted is of great value to the practical farmer.

"Mangolds can be grown continuously on the same land without injuring the tilth of the land or the health of the crop.

"A liberal dressing of farmyard manure forms the best basis of the manure for mangolds.

"The crop will further respond to considerable additions of active nitrogenous manures to the dung, particularly of nitrate of soda.

"A free supply of potash salts is essential to the proper development of the mangold, hence a specific potash manuring is desirable even when dung is used in large quantities, and on a strong soil initially rich in potash. When nitrogenous manures are used in addition to dung, the potash salts should be increased pro rata, in order to maintain the health and feeding value of the crop and to bring it to maturity.

"In conjunction with dung, phosphatic manure is hardly necessary and will give little appreciable return especially when the crop is grown in rotation.

"As soluble alkaline salts are beneficial to the mangold crop, either as direct foods or economisers of potash, a dressing of salt should always be included among the manures for the mangold crop."

Based upon these findings a liberal dressing for mangolds would be about 5 cords of good stable manure, 500 ℔s. nitrate ot soda, 500 ℔s. sulphate or muriate of potash, and 200 ℔s. of common salt per acre.

May, 1903.

FORAGE CROPS TO SUPPLEMENT SUMMER PASTURE AND WINTER HAY.

Because of the long continued drouth the prospects are very unfavorable for the hay crop. While it is to be hoped that before this reaches the eye of the reader the drouth will have been broken by copious rain, many farmers will still need to grow special forage crops to supplement the summer pasturage or the winter's hay. While Indian corn is the best forage plant for Maine, if a sufficient acreage has not been planted the season is so far advanced that other quicker growing plants can now be more advantageously used.

Hungarian grass, German, Pearl and Japanese Millets, Rape, and on light warm soils Early Soy Beans, are the most desirable. The smaller growing millets can be made into hay, the larger can be fed green or made into silage. Rape is valuable as a summer and fall feed for cattle, sheep, hogs and poultry. The Soy Bean is highly nitrogenous, but Maine is so far north as to make it a somewhat uncertain crop. Those who need to plant supplementary forage crops should send to the Secretary of Agriculture, Washington, D. C. (Do not inclose postage as the Department has free use of the mails), for the following Farmers' Bulletins:

No. 101. Millets.
No. 164. Rape as a Forage Crop.
No. 168. Pearl Millet.

Do not send to the Maine Experiment Station for these publications, as we cannot supply them.

June, 1903.

SUGGESTIONS REGARDING INSECTICIDES.

ARSENICAL AND NON-ARSENICAL POISONS.

Paris green is the standard poison containing arsenic. There are many brands in the market, none of which, according to our experience, are deficient in arsenic. As some brands contain uncombined arsenious acid, freshly slaked lime should always be applied with the Paris green unless it is used with Bordeaux mixture. Arsenate of lead is more expensive than Paris green, but adheres better to foliage. Four pounds of arsenate of lead carries about the same amount of arsenic as one pound of Paris green.

Full directions for using Paris green and arsenate of lead for potatoes or orchards will be sent upon application to the Station.

There are a number of insecticides on the market, such as Black Death, Dead Shot, English Bug Compound, Hammond's Slug Shot, Kno-bug and Quick Death, that depend upon arsenic for their value as insecticides. These consist chiefly of Paris green (2 to 4 per cent) mixed with plaster, coal dust, or some other "filler," and for practical purposes may be regarded as badly adulterated Paris green. Their cost per pound is considerably less than that of a pure Paris green, but the poison they carry costs the consumer from 5 to 10 times as much as it would if he were to buy a good green and mix it with the inert materials. While these goods are seldom labelled "Poison" they are, nevertheless, poisonous and should be handled as carefully as Paris green and kept out of the way of children and animals.

Bug Death is the only poison in at all common use which does not carry arsenic. It consists chiefly of oxide of zinc, and is a much less dangerous and active poison than any that carry arsenic. It requires from 35 to 50 pounds of Bug Death to do the work of one pound of Paris green. Its cost per pound is about one-third that of Paris green.

Bulletin 87 of the Maine Experiment Station, which discusses these insecticides at considerable length, will be sent free to any resident of Maine on application.

July, 1903.

POOR "STAR BRAND" COTTON SEED MEAL.

Since July 28, thirteen samples of Star Brand Cotton seed meal, put out by Sledge and Wells, Memphis, Tenn., have been sent to the Station for analysis. Eleven of these samples were sent by the importers and were taken from as many cars. Because of the poor appearance of the goods, samples were sent to the Station and the company has refused to handle the meal. The other two samples were from the same locality. None of these goods had the appearance of prime cotton seed meal. Most of them were of poor color and full of hulls. Two of the samples carried a good deal of cotton and appeared "wooly." Two of the samples carried 45 per cent protein, one carried 43 and the others carried from 35 to 40 per cent protein. None of them had the sweet nutty flavor characteristic of good cotton seed meal; some of the samples were tasteless, others had a bad taste, in two cases being bitter as if burned. While all or nearly all of these goods have been or will be shipped out of the State, and no low grade goods of other brands have been reported, users of cotton seed meal should be on the lookout for poor meal and in case of any doubt as to quality samples should be sent to the Experiment Station at Orono, where prompt analysis will be made, free of charge.

August, 1903.

METEOROLOGICAL OBSERVATIONS.

Lat. 40° 54′ 2″ N. Lon. 68° 40′ 11″ W. Elevation 150 feet.

The instruments used at this Station are the same as those used in preceding years, and include: Wet and dry bulb thermometers; maximum and minimum thermometers; rain-gauge; self-recording anemometer, vane, and barometer. The observations at Orono now form an almost unbroken record of thirty-five years.

The month of March was the warmest reported for that month for 35 years, being 9.°43 above the mean of that period. The two succeeding months were also warmer than usual, and much early planting was done. April proved exceptionally dry, while in May less than three-fourth of an inch of rain fell. That the latter conditions were not confined to the immediate vicinity of Orono may be seen from the table given on page 212. As a result of the drought, many early plantings failed to germinate, and when the growing season had fairly begun, the late frosts of May and June caused much damage. If the fall frosts had not been delayed beyond the usual time, many crops would have failed to mature. The rainfall for the year was nearly seven inches below the average. As a result, winter found but little water in the ground and the rivers low.

Alterations upon the Experiment Station building made it necessary to remove the anemometer during a part of September and October; for this reason the wind record for these months is incomplete and is not included in the following table.

METEOROLOGICAL SUMMARY FOR 1903.

Observations Made at the Maine Experiment Station.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean.	Total.
Highest barometer.	30.38	30.14	30.55	30.24	30.34	30.13	29.95	30.22	30.27	30.24	30 49	30.25	30.27	......
Lowest barometer	28.98	28.98	29.28	29.26	29.58	29.64	29.30	29.36	29.64	29.24	29.21	29.29	29.51	......
Mean barometer	29.68	29.74	30.04	29.70	29.95	29.85	29.70	29.86	29.90	29.79	29.78	29.77	29.81	.....
Highest temperature	41°.0	50°.0	64°.0	76°.0	83°.0	81°.0	88°.0	81°.0	89°.0	71°.0	70°.0	50°.0	....	......
Lowest temperature.............	—23°.0	—16°.0	0°.0	18°.0	26°.0	32°.0	34°.0	38°.0	29°.0	22°.0	2°.0	—10°.0	....	......
Mean temperature	15°.74	19°.21	37°.52	43°.00	54°.44	60°.38	62°.10	60°.50	60°.23	47°.10	33°.80	20°.00	42°.83	.....
Mean temperature for 35 years	16°.04	19°.22	28°.09	40°.66	52°.35	61°.88	66°.83	64°.94	57°.31	46°.11	34°.24	19°.99	42°.30	......
Total precipitation in inches	3.62	3.92	6.22	1.71	0.73	2.12	6.49	2.22	1.21	3.44	2.79	3.14	....	37.61
Mean precipitation for 35 years..........	4.32	3.99	4.50	2.87	3.45	3.59	3.36	3.57	3.31	3.94	3.78	3.89	....	44.57
No. of days with precip.of .01 in. or more	9	8	11	5	3	6	15	7	4	8	9	9	......	94
Snow fall in inches	15.2	21.5	2	0.5	.. ...	......	....	... ...	....	1.0	15.5	9.2	....	64.9
Average snow fall for 35 years.......... ..	22.7	21.5	16.3	5.3	0.3	. ...	.... ..	....	....	0.9	8.2	16.9	... ..	92.1
Number of clear days......	11	12	15	12	20	10	8	18	15	11	12	11	....	155
Number of fair days	5	8	3	8	5	7	10	7	10	7	4	8	....	82
Number of cloudy days	15	8	13	10	6	13	13	6	5	13	14	12	....	128
Total movement of wind in miles	4303	5379	6457	6568	6342	4800	4521	4246	*	*	3863	5068	....	......

* Record incomplete, owing to temporary removal of the anemometer.

Monthly and Annual Precipitation (as rain) for the Year 1903.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Bar Harbor	5.83	5.30	10.05	3.65	1.65	3.23	3.25	0.75	1.68	5.28	3.07	3.35	47.99
Belfast	4.96	5.13	8.94	1.45	0.53	3.51	4.12	2.69	0.84	3.99	2.40	4.20	42.88
Cornish	4.54	4.50	6.84	2.81	0.27	8.83	3.69	3.28	1.27	4.21	1.63	3.19	45.06
Eastport	3.85	4.01	4.98	3.33	2.52	1.69	3.85	1.14	1.62	2.83	3.59	3.20	36.67
Fairfield	3.94	3.39	6.35	1.95	0.37	3.56	......	......	......	......	1.06	2.70	......
Farmington	3.61	2.81	5.67	2.47	0.59	5.70	4.27	1.14	1.17	3.08	1.24	4.19	35.94
Fort Fairfield	......	6.10	......	1.25	0.35	1.93	3.82	......	0.60	1.90	1.65	1.55	......
Gardiner	4.54	3.63	6.65	1.42	0.45	5.12	4.77	2.90	1.34	3.82	1.63	3.56	39.83
Houlton	3.14	2.68	5.49	2.50	0.30	2.45	2.78	1.55	1.15	2.40	2.62	2.00	28.06
Lewiston	4.48	4.15	6.32	2.11	0.35	5.30	3.90	2.53	1.44	3.53	1.58	4.13	39.82
Mayfield	5.48	3.27	5.33	1.56	0.58	6.54	5.27	3.03	0.85	3.12	1.61	3.06	39.70
Millinocket	3.34	3.30	6.39	1.96	0.72	2.07	4.25	2.48	2.82	2.72	2.64	3.64	36.33
North Bridgton	4.20	4.02	5.62	2.02	0.54	6.38	3.45	2.88	2.16	4.04	1.02	3.36	39.69
Orono	3.62	3.48	6.22	1.71	0.73	2.12	6.49	2.22	1.21	3.44	2.79	3.14	37.61
Patten	1.60	......	3.02	......	0.12	2.29	4.03	2.64	0.69	2.58	2.42	3.40	......
Portland	4.90	3.44	5.60	2.51	0.68	5.53	2.50	1.85	2.06	3.57	1.44	3.46	35.54
Rumford Falls	3.51	3.89	4.09	1.51	0.18	5.25	6.01	2.96	1.21	2.69	0.98	3.63	35.91
South Lagrange	......	......	......	......	......	......	......	......	......	2.99	1.85	2.51	......
Van Buren	2.70	3.81	4.65	2.25	1.56	2.03	4.71	3.05	1.12	2.57	2.05	2.51	33.01
Vanceboro	2.20	3.30	......	1.89	0.20	3.40	......	......	......	......	5.08	......	......

With the exception of readings from the Orono station, the above table is compiled from the monthly bulletins of the U. S. Weather Bureau.

REPORT OF THE TREASURER.

Maine Agricultural Experiment Station in account with the United States appropriation, 1902–1903.

DR.

To receipts from the Treasurer of the United States as per appropriation for the fiscal year ending June 30, 1903, as per act of Congress approved March 2, 1887		$15,000 00

CR.

By salaries:		
(a) Director and administration officers	$2,557 14	
(b) Scientific staff	3,500 00	
(c) Assistants to scientific staff	1,800 00	
(d) Special and temporary services	82 31	
Total		7,939 45
Labor:		
(a) Monthly employees	$1,050 00	
(b) Daily employees	758 42	
Total		1,808 42
Publications		22 75
Postage and stationery		278 74
Freight and express		149 12
Heat, light and water		954 60
Chemical supplies:		
(a) Chemicals	$145 73	
(b) Other supplies	32 23	
Total		177 96
Seeds, plants and sundry supplies:		
(a) Agricultural	$78 83	
(b) Horticultural	328 12	
(e) Miscellaneous	95 19	
Total		502 14
Fertilizers		142 80
Feeding stuffs		1,372 06
Library		276 93
Tools, implements and machinery		227 20
Furniture and fixtures		331 39
Scientific apparatus		110 71
Live stock:		
(b) Cattle	$100 00	
(e) Poultry	71 00	
(f) Sundries	51 11	
Total		222 11
Contingent expenses		15 00
Traveling expenses		279 87
Buildings and repairs		188 75
Total		$15,000 00

ISAIAH K. STETSON, *Treasurer.*

I, the undersigned, duly appointed Auditor of the Corporation, do hereby certify that I have examined the books of the Maine Agricultural Experiment Station for the fiscal year ending June 30, 1903, that I have found the same well kept and classified as above, and that the receipts for the year from the Treasurer of the United States are shown to have been $15,000.00, and the corresponding disbursements, $15,000.00; for all of which proper vouchers are on file and have been examined by me and found correct.

And I further certify that the expenditures have been solely for the purposes set forth in the act of Congress approved March 2, 1887.

GEO. E. FELLOWS, *Auditor.*

Maine Agricultural Experiment Station in account with "General Account" for the year ending June 30, 1903.

Dr.		
To balance from 1901-1902	$28 06	
Sales of produce, fees, etc	6,329 77	$6,357 83
Cr.		
By salaries	$2,783 20	
Labor	1,400 00	
Heat, light and water	250 00	
Feeding stuffs	345 88	
Traveling expenses	158 89	
Buildings and repairs	1,299 00	
Balance to 1903-1904 account	120 86	6,357 83

INDEX.

PAGE

- Aleyrodes chelidonii 125
  - plant-house 125
    - anatomy 134
    - embryology 126
    - remedies 137
- Aleyrodes vaporariorum 125
- Alsophila pometaria 122
- Ammonia salts in fertilizers 27
- Angora goats, notes on 193
- Animal meal, analysis 60
- Apple orchards, culture 1
  - scab and potash fertilizers 16
- Apples, effect of potash fertilizers 12
- Aroostook county wheats and flours 145
- Arsenical insecticides 208
- Available phosphoric acid 28
- Babcock test, law regulating use 104
- Baking tests of Aroostook milled flours 149
  - of flours from milling experiments 175
- Beef scrap, analyses 60
- Biles Fourex 63
- Blight, potato, resistance to 181
- Blissus leucopteris 41
- Blue stem wheat 158, 169, 170
  - effect of change of climate 158
- Bordeaux mixture for potato blight 181
- Breeding for egg production 69
- Bug Death vs. Paris green 189
- By-products of the oat 65
- Canker-worm, how to fight 123
  - fall 122
  - spring 121
- Chinch bug, description 41
  - enemies and checks 43
  - habits 42
  - in Maine 44
  - remedies 45
  - resistant powers 48

PAGE
Cleft-grafting 21
Cotton seed meal, analyses.... 54
  high grade.... 60
  low grade.... 60, 209
Cultivation, effect on growth of apple trees.... 8
Dairymen, act for protection of.... 104
Dandelion, fall.... 109
  cultivated 112
Egg production, breeding for.... 69
  records of foundation stock.... 74
    of pullets, 1901-1902.... 71
Eggs, fertility.... 82
Embryology of Aleyrodes.... 126
Fall dandelion 109
Feeding stuff inspection.... 53
  law, chief requirements.... 53
  analyses 55
  law relating to.... 66
Fertility of eggs.... 82
Fertilizers, analyses.... 33, 95
  for mangolds.... 205
  inspection 25, 93
  law, chief provisions.... 40
  valuations 29
  constituents 27
  for orchards.... 2, 19
  terms used.... 27
  trade valuation.... 102
Fertilizing ingredients, trade values.... 30
Fife wheat 167
  effect of change of climate.... 157
Flour, amounts produced from wheat.... 173
  consumption in the United States.... 146
  mills of Aroostook county.... 145
  standards 150
Flours, composition.... 147, 165
  comparison of Maine and western grown.... 146
  of Aroostook county 145
    baking tests.... 149
Forage crops.... 207
Ginseng 117
Glassware for Babcock test.... 104
Gluten feed, analyses.... 57
  in flour, determination.... 150
  meal, analyses.... 57
  meals and feeds.... 63
Goats, Angora, notes on.... 193
Grafting apple orchards.... 21
  wax, how to make.... 23

PAGE
Grass land, top dressing with chemicals 107
Gravenstein, types of tree 7
Greens, dandelion, effects of digging 111
Hawkweed, orange 114
Haynes blue stem wheat 166
Hen manure, amount per hen 202
composition 200
preservation 199
Hens, first and second years' laying 74
housing experiments 77
High grade cotton seed meal 60
Hieracium aurantiacum 114
prealtum 115
Housing experiments with hens 77
Improvement of wheat 179
Incubation experiments in 1902 80
Insecticides 208
Inspection of feeding stuffs 53
of fertilizers 25, 93
Kainite and apple scab 17
King-Devil weed 115
Lamona wheat, effect of change of climate 157
Law, feeding stuff 66
chief requirements 53
fertilizer, chief provisions 40
regulating use of Babcock test 104
Leontodon autumnale 109
Linseed meal, analyses 56
Linseed meals 62
Low grade cotton seed meal 60
Mangel wurzels, fertilizers for 205
Mangolds, fertilizers for 205
Manure, hen, preservation 199
Meat meal, analyses 60
and scraps 65
Meteorological observations 210
Middlings, loss of flour in 174
Millet for a forage crop 207
Milling experiments with wheat 164
summary 172
Mixed feeds, analyses 59
Mulching, effect on growth of apple trees 8
Muriate of potash, top dressing for grass 107
Newspaper bulletins 205
Nitrates in fertilizers 28
Nitrate of soda, top dressing for grass land 107
Nitrogen in fertilizers 27
loss in hen manure 200
organic 27

PAGE
Oat by-products 65
    feeds, analyses 58
Open front poultry house 77
Orange hawkweed 114
Orchard culture, experiments 1
    growth and condition of trees 5
    methods of dressing 2
    renovation 18
    yield of fruit 11
Orchards, effects of potash salts 13
    effect of stable manure 8
    for experiment, history 1, 13
    top-working 20
Organic nitrogen in fertilizers 27
Paleacrita vernata 121
Paris green vs. Bug Death 189
Phosphates, various forms 28
Phosphoric acid in fertilizers 28
Pine Cone lime for Bordeaux mixture 189
Plant-house Aleyrodes 125
Plymouth Rock hens, egg records 72
Potash fertilizers and apple scab 16
    fertilizers, effect on apples 12
    in commercial fertilizers 28
    muriate, top dressing for grass 107
Potato blight, resistance to 181
    experiments in 1903 181
Potatoes, variety test 181
Poultry experiments in 1902 69
    house, details of construction 77
    housing and egg records 77
Protein in American wheats 153
Pullets, egg records 71
Rainfall for 1903 212
Renovation of orchards 18
Reverted phosphoric acid 28
Roller flour mills of Aroostook county 145
Roosting closets, close 79
Scientific fertilizer 103
Soils, treatment for orchards 9
Soluble phosphoric acid 28
Soy beans for a forage crop 207
Spraying for potato blight 181
Star Brand cotton seed meal 209
Tallman apple trees, culture and growth 8
Taraxicum officinale 111
Top dressing for grass lands 107
Top-working of orchards 20

PAGE

Trade values of fertilizing ingredients........................ 30
Treasurer's report.. 213
Valuation of fertilizers.................................. 29, 102
Wax for grafting.. 23
Weather report for 1903................................... 210
Wellman's Fife wheat 157, 165
Wheat, American, composition.............................. 153
  blue stem..158, 169, 170
  bran and middlings...................................... 65
  effect of climate....................................... 152
  effect of change of climate............................. 157
  fife 167
  Haynes blue stem.. 166
  improvement... 179
  Lamona 157
  Maine grown, composition................................ 152
  milling experiments..................................... 164
  Wellman's fife.. 157, 165
  white Russian... 168
  yields in flour... 173
Wheats, composition of seed and progeny................... 161
  Maine and western compared.............................. 159
  Maine, from western seed................................ 159
  northwestern grown in Maine............................. 160
  of Aroostook county..................................... 145
  of Maine and the Northwest, composition................. 155
  of the Northwest grown in Maine......................... 156
  variation in protein content............................ 153
White Russian wheat....................................... 168
Wyandottes, white, egg record............................. 73

NINETEENTH ANNUAL REPORT

OF THE

Maine Agricultural Experiment Station

ORONO, MAINE.

1903.

AUGUSTA
KENNEBEC JOURNAL PRINT
1904

The Bulletins of this Station will be sent free to any address in Maine. All requests should be sent to

Agricultural Experiment Station,
Orono, Maine.

STATE OF MAINE.

Geo. E. Fellows, Ph. D., President of the University of Maine:

SIR:—I transmit herewith the Nineteenth Annual Report of the Maine Agricultural Experiment Station for the year ending December 31, 1903.

CHARLES D. WOODS,
Director.

ORONO, ME., December 31, 1903.

MAINE
AGRICULTURAL EXPERIMENT STATION,
ORONO, MAINE.

THE STATION COUNCIL.

PRESIDENT GEORGE E. FELLOWS	*President*
DIRECTOR CHARLES D. WOODS	*Secretary*
JOHN A. ROBERTS, Norway	*Committee of Board of Trustees*
CHARLES L. JONES, Corinna	
ALBERT J. DURGIN, Orono	
AUGUSTUS W. GILMAN, Foxcroft	*Commissioner of Agriculture*
EUGENE H. LIBBY, Auburn	*State Grange*
CHARLES S. POPE, Manchester	*State Pomological Society*
RUTILLUS ALDEN, Winthrop	*State Dairymen's Association*
JAMES M. BARTLETT	*Members of the Station Staff*
LUCIUS H. MERRILL	
FREMONT L. RUSSELL	
WELTON M. MUNSON	
GILBERT M. GOWELL	
*GILMAN A. DREW	

THE STATION STAFF.

THE PRESIDENT OF THE UNIVERSITY.

CHARLES D. WOODS	*Director*
JAMES M. BARTLETT	*Chemist*
LUCIUS H. MERRILL	*Chemist*
FREMONT L. RUSSELL	*Veterinarian*
WELTON M. MUNSON	*Horticulturist*
GILBERT M. GOWELL	*Stock Breeding and Poultry*
*GILMAN A. DREW	*Zoologist*
†EDWARD R. MANSFIELD	*Assistant Chemist*
HERMAN H. HANSON	*Assistant Chemist*
‡SANFORD C. DINSMORE	*Assistant Chemist*
§HORACE W. BRITCHER	*Assistant Zoologist*
MARSHALL P. CUMMINGS	*Assistant in Horticulture*

---

* Until July 1, 1903.

† Resigned June, 1903.

‡ Appointed July, 1903.

§ Died, 1903.

TABLE OF CONTENTS.

PAGE
Letter of transmittal.. III
Officers of the Sation IV
Announcements VII

Experiments in Orchard Culture (Bulletin 89) 1
Fertilizer Inspection (Bulletin 90) 25
The Chinch Bug in Maine (Bulletin 91)........................ 41
Feeding Stuff Inspection (Bulletin 92)......................... 53
Breeding for Egg Production (Bulletin 93) 69
Fertilizer Inspection (Bulletin 94)............................. 93
Scientific Fertilizer (Bulletin 94) 103
Top Dressing Grass Land (Bulletin 94) 107
Dandelions (Bulletin 95).. 109
Hawkweeds (Bulletin 95).. 114
Ginseng (Bulletin 95)... 117
Canker Worms (Bulletin 95) 121
Plant-house Aleyrodes (Bulletin 96) 125
Wheats and Flours of Aroostook County (Bulletin 97) 145
Potato Experiments in 1903 (Bulletin 98) 181
Notes on the Angora Goat (Bulletin 98)..... 193
The Preservation of Hen Manure (Bulletin 98) 199
Fertilizers for Mangolds (Bulletin 99).......................... 205
Forage Crops to Supplement Pasturage and Hay (Bulletin 99) .. 207
Suggestions regarding Insecticides (Bulletin 99) 208
Poor "Star Brand" Cotton Seed Meal (Bulletin 99)............. 209
Meteorological Observations (Bulletin 99) 210
Report of the Treasurer (Bulletin 99)........................... 213
Index to Report... 215

ANNOUNCEMENTS.

THE AIM OF THE STATION.

Every citizen of Maine concerned in agriculture has the right to apply to the Station for any assistance that comes within its province. It is the wish of the Trustees and Station Council that the Station be as widely useful as its resources will permit.

In addition to its work of investigation, the Station is prepared to make chemical analyses of fertilizers, feeding stuffs, dairy products and other agricultural materials; to test seeds and creamery glass-ware; to identify grasses, weeds, injurious fungi and insects, etc.; and to give information on agricultural matters of interest and advantage to the citizens of the State.

All work proper to the Experiment Station and of public benefit will be done without charge. Work for the private use of individuals is charged for at the actual cost to the Station. The Station offers to do this work only as a matter of accommodation. Under no condition will the Station undertake analyses, the results of which cannot be published, if they prove of general interest.

INSPECTIONS.

The execution of the laws regulating the sale of commercial fertilizers, concentrated commercial feeding stuffs, and agricultural seeds, and the inspection of chemical glassware used by creameries is entrusted to the Director of the Station. The Station officers take pains to obtain for analysis samples of all brands of fertilizers and feeding stuffs coming under the law, but the organized co-operation of farmers is essential for the full and timely protection of their interests. Granges, Farmers' Clubs and other organizations can render efficient aid by reporting any attempt at evasion of the laws and by sending, early in the season, samples taken from stock in the market and drawn in accordance with the Station directions for sampling. In case there should be a number of samples of the same brand sent in, the Station reserves the right to analyze only in part.

STATION PUBLICATIONS.

The Station publishes several bulletins each year, covering in detail its expenses, operations, investigations and results. The bulletins are mailed free to all citizens who request them.

CORRESPONDENCE.

As far as practicable, letters are answered the day they are received. Letters sent to individual officers are liable to remain unanswered, in case the officer addressed is absent. All communications should, therefore, be addressed to the

Agricultural Experiment Station,
Orono, Maine.

The post office, railroad station, freight, express and telegraph address is Orono, Maine. Visitors to the Station can take the electric cars at Bangor and Old Town.

The telephone call is "Orono 5."

Directions, forms and labels for taking samples, of fertilizers, feeding stuffs and seeds for analysis can be had on application.

Parcels sent by express should be prepaid, and postage should be enclosed in private letters demanding a reply.

CHAS. D. WOODS, *Director.*

LIST OF BULLETINS PUBLISHED IN 1903.

89. Experiments in Orchard Culture.
90. Fertilizer Inspection.
91. The Chinch Bug in Maine.
92. Feeding Stuff Inspection.
93. Poultry Experiments in 1902.
94. Fertilizer Inspection. Top-dressing Grass Lands with Chemicals.
95. Dandelion. Hawkweed. Ginseng. Cankerworm.
96. Plant House Aleyrodes.
97. Wheats and Flours of Aroostook County.
98. Potato Experiments in 1903. Notes on the Angora Goat. The Preservation of Hen Manure.
99. Finances. Meteorology. Index.